

## SEQUENCE LISTING

&lt;110&gt; BASF Aktiengesellschaft

&lt;120&gt; NADH-dependent cytochrome b5 reductase as target for herbicides

&lt;130&gt; PF 53755

&lt;150&gt; DE 102 32 778

&lt;151&gt; 2002-07-18

&lt;160&gt; 22

&lt;170&gt; PatentIn version 3.1

&lt;210&gt; 1

&lt;211&gt; 846

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis thaliana

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(843)

&lt;223&gt;

&lt;400&gt; 1

atg gat acc gag ttt ctc cga acc cta gat cgt cag att ctt ttg ggt	48
Met Asp Thr Glu Phe Leu Arg Thr Leu Asp Arg Gln Ile Leu Leu Gly	
1 5 10 15	

gtc ttc gtt gct ttc gtc gcc gtt ggt gct ggt gct gct tat ttt ctt	96
Val Phe Val Ala Phe Val Ala Val Gly Ala Gly Ala Ala Tyr Phe Leu	
20 25 30	

aca tcc tcc aag aaa cgc aga gtg tgt ttg gat cca gag aat ttc aag	144
Thr Ser Ser Lys Lys Arg Arg Val Cys Leu Asp Pro Glu Asn Phe Lys	
35 40 45	

gag ttc aag ctt gtt aag aga cat cag ctt agt cac aat gtg gcc aag	192
Glu Phe Lys Leu Val Lys Arg His Gln Leu Ser His Asn Val Ala Lys	
50 55 60	

ttc gtt ttt gaa ctc cca act tct act tct gtg ttg ggt ctt ccc att	240
Phe Val Phe Glu Leu Pro Thr Ser Thr Ser Val Leu Gly Leu Pro Ile	
65 70 75 80	

gga caa cac atc agt tgc agg gga aag gat ggt caa gga gag gat gtt	288
Gly Gln His Ile Ser Cys Arg Gly Lys Asp Gly Gln Gly Glu Asp Val	
85 90 95	

## 2

```

att aag cca tac acc ccg act acg tta gac tct gac gtt gga cgt ttc 336
Ile Lys Pro Tyr Thr Pro Thr Thr Leu Asp Ser Asp Val Gly Arg Phe
100 105 110

gaa ctt gtc att aag atg tat ccg caa gga cgg atg tct cat cat ttc 384
Glu Leu Val Ile Lys Met Tyr Pro Gln Gly Arg Met Ser His His Phe
115 120 125

agg gag atg cgt gtt gga gac cat ctt gcc gta aag gga cca aag ggt 432
Arg Glu Met Arg Val Gly Asp His Leu Ala Val Lys Gly Pro Lys Gly
130 135 140

agg ttc aag tat caa cca ggt cag ttt agg gca ttt gga atg ctt gct 480
Arg Phe Lys Tyr Gln Pro Gly Gln Phe Arg Ala Phe Gly Met Leu Ala
145 150 155 160

gga ggt tca ggc atc act ccc atg ttc caa gtg gcc aga gca att cta 528
Gly Gly Ser Gly Ile Thr Pro Met Phe Gln Val Ala Arg Ala Ile Leu
165 170 175

gaa aac cca aca gac aag aca aag gtg cat ctc att tac gcc aac gtc 576
Glu Asn Pro Thr Asp Lys Thr Lys Val His Leu Ile Tyr Ala Asn Val
180 185 190

aca tac gac gac att ctc ttg aag gaa gaa ttg gag ggt ctt act acc 624
Thr Tyr Asp Asp Ile Leu Leu Lys Glu Glu Leu Glu Gly Leu Thr Thr
195 200 205

aat tac cct gaa caa ttt aaa atc ttc tat gtt ttg aac cag cct ccg 672
Asn Tyr Pro Glu Gln Phe Lys Ile Phe Tyr Val Leu Asn Gln Pro Pro
210 215 220

gaa gta tgg gat ggt ggt gtt gga ttt gta tca aag gaa atg att cag 720
Glu Val Trp Asp Gly Gly Val Gly Phe Val Ser Lys Glu Met Ile Gln
225 230 235 240

act cat tgc cct gca cct gca tct gat att cag atc cta aga tgc gga 768
Thr His Cys Pro Ala Pro Ala Ser Asp Ile Gln Ile Leu Arg Cys Gly
245 250 255

cca ccg cca atg aac aag gcc atg gct gca aac ctt gaa gct ctg gga 816
Pro Pro Pro Met Asn Lys Ala Met Ala Ala Asn Leu Glu Ala Leu Gly
260 265 270

tac tct ccg gag atg caa ttc cag ttc tga 846
Tyr Ser Pro Glu Met Gln Phe Gln Phe
275 280

```

&lt;210&gt; 2

&lt;211&gt; 281

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 2

Met	Asp	Thr	Glu	Phe	Leu	Arg	Thr	Leu	Asp	Arg	Gln	Ile	Leu	Leu	Gly	1	5	10	15
Val	Phe	Val	Ala	Phe	Val	Ala	Val	Gly	Ala	Gly	Ala	Ala	Tyr	Phe	Leu	20	25	30	
Thr	Ser	Ser	Lys	Lys	Arg	Arg	Val	Cys	Leu	Asp	Pro	Glu	Asn	Phe	Lys	35	40	45	
Glu	Phe	Lys	Leu	Val	Lys	Arg	His	Gln	Leu	Ser	His	Asn	Val	Ala	Lys	50	55	60	
Phe	Val	Phe	Glu	Leu	Pro	Thr	Ser	Thr	Ser	Val	Leu	Gly	Leu	Pro	Ile	65	70	75	80
Gly	Gln	His	Ile	Ser	Cys	Arg	Gly	Lys	Asp	Gly	Gln	Gly	Glu	Asp	Val	85	90	95	
Ile	Lys	Pro	Tyr	Thr	Pro	Thr	Thr	Leu	Asp	Ser	Asp	Val	Gly	Arg	Phe	100	105	110	
Glu	Leu	Val	Ile	Lys	Met	Tyr	Pro	Gln	Gly	Arg	Met	Ser	His	His	Phe	115	120	125	
Arg	Glu	Met	Arg	Val	Gly	Asp	His	Leu	Ala	Val	Lys	Gly	Pro	Lys	Gly	130	135	140	
Arg	Phe	Lys	Tyr	Gln	Pro	Gly	Gln	Phe	Arg	Ala	Phe	Gly	Met	Leu	Ala	145	150	155	160
Gly	Gly	Ser	Gly	Ile	Thr	Pro	Met	Phe	Gln	Val	Ala	Arg	Ala	Ile	Leu	165	170	175	
Glu	Asn	Pro	Thr	Asp	Lys	Thr	Lys	Val	His	Leu	Ile	Tyr	Ala	Asn	Val	180	185	190	
Thr	Tyr	Asp	Asp	Ile	Leu	Leu	Lys	Glu	Glu	Leu	Glu	Gly	Leu	Thr	Thr	195	200	205	
Asn	Tyr	Pro	Glu	Gln	Phe	Lys	Ile	Phe	Tyr	Val	Leu	Asn	Gln	Pro	Pro	210	215	220	
Glu	Val	Trp	Asp	Gly	Gly	Val	Gly	Phe	Val	Ser	Lys	Glu	Met	Ile	Gln	225	230	235	240
Thr	His	Cys	Pro	Ala	Pro	Ala	Ser	Asp	Ile	Gln	Ile	Leu	Arg	Cys	Gly	245	250	255	
Pro	Pro	Pro	Met	Asn	Lys	Ala	Met	Ala	Ala	Asn	Leu	Glu	Ala	Leu	Gly	260	265	270	

Tyr Ser Pro Glu Met Gln Phe Gln Phe  
 275 280

<210> 3

<211> 729

<212> DNA

<213> Nicotiana tabacum

<220>

<221> CDS

<222> (1)..(726)

<223>

<400> 3

gta tgc ttg gat cct gag agg ttc aag gaa ttt aag ctt gtg aag cgt	48
Val Cys Leu Asp Pro Glu Arg Phe Lys Glu Phe Lys Leu Val Lys Arg	
1 5 10 15	
aca caa ata agc cac aat gtt gca aag ttc aga ttt gaa ctc ccc aca	96
Thr Gln Ile Ser His Asn Val Ala Lys Phe Arg Phe Glu Leu Pro Thr	
20 25 30	
cct act tct gta ttg ggc cta ccc att gga caa cat att agt tgc agg	144
Pro Thr Ser Val Leu Gly Leu Pro Ile Gly Gln His Ile Ser Cys Arg	
35 40 45	
ggc aag gat agt caa ggt gaa gag gtt gtt aaa ccg tac aca cca act	192
Gly Lys Asp Ser Gln Gly Glu Glu Val Val Lys Pro Tyr Thr Pro Thr	
50 55 60	
act ttg gat tca gat gtt gga tat ttt gaa cta gtt att aag atg tat	240
Thr Leu Asp Ser Asp Val Gly Tyr Phe Glu Leu Val Ile Lys Met Tyr	
65 70 75 80	
cct caa gga agg atg tct cat cat ttc cga gaa atg cgt gag ggt gat	288
Pro Gln Gly Arg Met Ser His His Phe Arg Glu Met Arg Glu Gly Asp	
85 90 95	
tat ttg gct gtg aag gga cct aag ggc cgc ttt aag tac cag cct ggc	336
Tyr Leu Ala Val Lys Gly Pro Lys Gly Arg Phe Lys Tyr Gln Pro Gly	
100 105 110	
caa gtg aga gca ttt gga atg ctt gct gga ggc tct ggc att acc cca	384
Gln Val Arg Ala Phe Gly Met Leu Ala Gly Gly Ser Gly Ile Thr Pro	
115 120 125	
atg ttt cag gtt gct aga gct att ctc gaa aat cca aat gac aag aca	432
Met Phe Gln Val Ala Arg Ala Ile Leu Glu Asn Pro Asn Asp Lys Thr	
130 135 140	
aag gtg cac ttg ata tat gct aat gtt acc tat gaa gac ata ctt tta	480
Lys Val His Leu Ile Tyr Ala Asn Val Thr Tyr Glu Asp Ile Leu Leu	
145 150 155 160	

## 5

aag gaa cag ttg gat ggc ctt gct gct aac tat cct gac cgt ttc aaa 528  
 Lys Glu Gln Leu Asp Gly Leu Ala Ala Asn Tyr Pro Asp Arg Phe Lys  
                   165                                  170                                  175

att tat tac gta ctg aat cag cct cct gaa gta tgg agc ggt ggt gtt 576  
 Ile Tyr Tyr Val Leu Asn Gln Pro Pro Glu Val Trp Ser Gly Gly Val  
                   180                                  185                                  190

gga ttt gtg tcc aag gaa atg att cag act cat tgt cct gcc ccg gca 624  
 Gly Phe Val Ser Lys Glu Met Ile Gln Thr His Cys Pro Ala Pro Ala  
                   195                                  200                                  205

tct gac att cag ata ctg agg tgt ggt cca cct cca atg aac aag gct 672  
 Ser Asp Ile Gln Ile Leu Arg Cys Gly Pro Pro Pro Met Asn Lys Ala  
                   210                                  215                                  220

atg gct gct cat ctt gaa gcc ctt gga tac acc cca gag atg caa ttc 720  
 Met Ala Ala His Leu Glu Ala Leu Gly Tyr Thr Pro Glu Met Gln Phe  
                   225                                  230                                  235                                  240

cag ttt taa 729  
 Gln Phe

<210> 4

<211> 242

<212> PRT

<213> Nicotiana tabacum

<400> 4

Val Cys Leu Asp Pro Glu Arg Phe Lys Glu Phe Lys Leu Val Lys Arg  
   1                                  5                                  10                                  15

Thr Gln Ile Ser His Asn Val Ala Lys Phe Arg Phe Glu Leu Pro Thr  
                   20                                  25                                  30

Pro Thr Ser Val Leu Gly Leu Pro Ile Gly Gln His Ile Ser Cys Arg  
                   35                                  40                                  45

Gly Lys Asp Ser Gln Gly Glu Glu Val Val Lys Pro Tyr Thr Pro Thr  
                   50                                  55                                  60

Thr Leu Asp Ser Asp Val Gly Tyr Phe Glu Leu Val Ile Lys Met Tyr  
                   65                                  70                                  75                                  80

Pro Gln Gly Arg Met Ser His His Phe Arg Glu Met Arg Glu Gly Asp  
                                   85                                  90                                  95

Tyr Leu Ala Val Lys Gly Pro Lys Gly Arg Phe Lys Tyr Gln Pro Gly  
                   100                                  105                                  110

Gln Val Arg Ala Phe Gly Met Leu Ala Gly Gly Ser Gly Ile Thr Pro  
                   115                                  120                                  125

## 6

Met Phe Gln Val Ala Arg Ala Ile Leu Glu Asn Pro Asn Asp Lys Thr  
 130 135 140

Lys Val His Leu Ile Tyr Ala Asn Val Thr Tyr Glu Asp Ile Leu Leu  
 145 150 155 160

Lys Glu Gln Leu Asp Gly Leu Ala Ala Asn Tyr Pro Asp Arg Phe Lys  
 165 170 175

Ile Tyr Tyr Val Leu Asn Gln Pro Pro Glu Val Trp Ser Gly Gly Val  
 180 185 190

Gly Phe Val Ser Lys Glu Met Ile Gln Thr His Cys Pro Ala Pro Ala  
 195 200 205

Ser Asp Ile Gln Ile Leu Arg Cys Gly Pro Pro Pro Met Asn Lys Ala  
 210 215 220

Met Ala Ala His Leu Glu Ala Leu Gly Tyr Thr Pro Glu Met Gln Phe  
 225 230 235 240

Gln Phe

<210> 5  
 <211> 32  
 <212> DNA  
 <213> Primer

<400> 5

tatacccgagg atggataccg agtttctccg aa

32

<210> 6  
 <211> 32  
 <212> DNA  
 <213> Primer

<400> 6

tatacccgagg gaactggaat tgcattctccg ga

32

<210> 7  
 <211> 20  
 <212> DNA  
 <213> Primer

<400> 7

gctatgacca tgattacgcc

20

<210> 8  
<211> 18  
<212> DNA  
<213> Primer

<400> 8

tgagacatcc gtccttgc

18

<210> 9  
<211> 20  
<212> DNA  
<213> Primer

<400> 9

acgttgtaaa acgacggcca

20

<210> 10  
<211> 19  
<212> DNA  
<213> Primer

<400> 10

ccgactacgt tagactctg

19

<210> 11  
<211> 21  
<212> DNA  
<213> Primer

<400> 11

ttcgttgctt tcgtcgccgt t

21

<210> 12  
<211> 21  
<212> DNA  
<213> Primer

<400> 12

gtttgcagcc atggccttgt t

21

<210> 13  
<211> 22

<212> DNA  
<213> Primer

<400> 13

ggcgggaaac gacaatctga tc

22

<210> 14  
<211> 32  
<212> DNA  
<213> Primer

<400> 14

tatagaattc atggataccg agtttctccg aa

32

<210> 15  
<211> 34  
<212> DNA  
<213> Primer

<400> 15

tatactgcag tcagaactgg aattgcatct ccgg

34

<210> 16  
<211> 16  
<212> DNA  
<213> Primer

<400> 16

agaattcgcg gccgct

16

<210> 17  
<211> 32  
<212> DNA  
<213> Primer

<400> 17

ctcatgcggc cgcgcgcaac gcaattaatg tg

32

<210> 18  
<211> 32  
<212> DNA



<213> Primer

<400> 18

tcatgcggcc gcgagatcca gttcgatgta ac

32

<210> 19

<211> 21

<212> DNA

<213> Primer

<400> 19

gtggattgat gtgatatctc c

21

<210> 20

<211> 21

<212> DNA

<213> Primer

<400> 20

gtaaggatct gagctacaca t

21

<210> 21

<211> 22

<212> DNA

<213> Primer

<400> 21

atggataccg agtttctccg aa

22

<210> 22

<211> 21

<212> DNA

<213> Primer

<400> 22

aactggaatt gcatctccgg a

21